

U.S. Application Serial No.: 10/655,584
Amendment Dated January 5, 2005
In Response to Office Action Dated October 5, 2004

Amendments to the Specification:

The abstract of the disclosure is amended as follows:

ABSTRACT OF THE DISCLOSURE

A method of fabricating an BEOL interconnect structures ~~on a semiconductor device having a plurality of via contacts with low via contact resistance is provided. The method includes~~ including the steps of: a) forming a porous or dense low k dielectric layer on a substrate; b) forming single or dual damascene etched openings in the low k dielectric; c) placing the substrate in a process chamber on a cold chuck at a temperature about -200 °C to about 25 °C; d) adding to the process chamber a condensable cleaning agent (CCA) to condense a layer of CCA within the etched openings on the substrate; and e) ~~performing an activation step while the wafer remains cold~~ activating at a temperature of about -200 °C to about 25 °C. ~~The via contacts are very stable during thermal cycles and during operation of the semiconductor device.~~ Also provided is an interconnect structure having a substrate, a conductive material disposed on the substrate, a porous or dense low k dielectric layer disposed on the conductive material, wherein the low k dielectric layer has a single or dual damascene etched openings that expose a surface of the conductive material, and metallic lines and vias etched onto the low k dielectric layer; wherein the exposed conductive material has been treated with a CCA and activated in the cold to remove oxide, oxygen and carbon containing residues from the surface of the conductive material.